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PENSOFT

First record of *Cynomops planirostris* (Peters, 1866) (Chiroptera, Molossidae) in Corrientes province, Argentina

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Abstract

Cynomops planirostris (Peters, 1866) was previously known in Argentina only from the provinces of Salta and Jujuy in the northwest and in Misiones in the northeast. Here, we newly report this species from the province of Corrientes and the Humid Chaco ecoregion. We also offer information on the natural history of the species and on the bat assemblage present in the study area. This record increases the number of species of bats known in Corrientes to 34.

Keywords

Humid Chaco, northeastern Argentina, range extension, Southern Dog-faced Bat

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Introduction

Corrientes is located in northeastern Argentina, in a region known as the Argentine Mesopotamia. It is a low-lying subtropical province, with plains, channels, marshes, lakes, and swamps, only rising to slightly higher elevations in the east. The Argentine Mesopotamia also includes the provinces of Misiones and Entre Ríos and is positioned in an area of high biogeographical interest due to the vegetational continuity with countries from more tropical latitudes, such as Brazil and Paraguay, which are potential suppliers of fauna. The province of Corrientes is, however, still poorly known regarding the composition of its bat fauna (Barquez 2004; Idoeta 2018), and new records, as presented here for the genus *Cynomops*, are an expected outcome from faunal surveys.

Until the 1980s, some authors still considered that *Cynomops* should be treated as a subgenus of *Molossops*. Freeman (1981: 118), for example, pointed out that "their shapes are similar enough to be included within one genus". She also referred to an article, by Gardner (1977), highlighting chromosomal differences between these genera, but indicating "...that variation in chromosome number among members of the same molossid

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genus does occur, for example in *Eumops*". As a consequence, she maintained *Cynomops* as a subgenus of *Molossops*.

Subsequently, few studies on these groups have been developed, but Barquez (1987) and Barquez et al. (1999) treated the two genera as valid, based on distinctive morphological characters, mainly the number of teeth, differences in molars, the shape of the skull, and shape of the ears, among other characters. For example, *Cynomops* has two pairs of lower incisors, an M3 with two commissures, a simple m3 with a talonid having only one cusp, lacrimal furrows that are strongly developed, and ears that are separated, but close to each other. Species of *Molossops*, on the other hand, have only one pair of lower incisors, an M3 with three commissures clearly marked, a complex m3 with a talonid with two notable cusps, lacrimal furrows that are less developed, and ears widely separated. Based on its distinctive characters, Thomas (1920: 189) described the genus *Cynomops* including *C. planirostris* (Peters, 1866) as a species, noting that "he would naturally have selected *planirostris* as the type species of the genus, but specimens from so many localities, including Buenos Ayres, have been assigned to that species that there is always a little doubt about its exact identity".

Moras et al. (2018), recognized eight species in *Cynomops*, but this number may be underestimated. These authors proposed that some specimens previously attributed to *C. paranus* (Thomas, 1901) are synonyms of *C. planirostris*, and others were included as synonym of *C. milleri* (Osgood, 1914), *C. freemani* Moras et al., 2018, or *C. tonkigui* Moras et al., 2018. The Argentine specimen cited as *C. paranus* by Barquez et al. (2020), however, is a clearly different species from *C. planirostris*, and it could possibly represent a species not yet described. The geographic distribution of the genus is very wide and extends from southern Mexico, through South America, south to Paraguay and northern Argentina, including Trinidad and Tobago (Moras et al. 2016, 2018), where it occupies a great diversity of habitats, from tropical and subtropical forests to wooded savannas and dry forests (Jung and Kalko 2011; Bader et al. 2015).

Cynomops planirostris is one of the species of the genus with the largest geographical range in South America, extending east of the Andes, throughout the subcontinent, to northern Argentina (Moras et al. 2016). In Argentina, *C. planirostris* is distributed only in the northwest and northeast of the country (Idoeta et al. 2012), with few records and large gaps between the most extreme points of its known distribution. Until 2012, these records were restricted to the northwest of the country, in the Yungas region, with extensions to the Chaco Seco, in the provinces of Salta and Jujuy (Barquez and Díaz 2001). Then, its distribution was extended to the northeast by Idoeta et al. (2012), to a locality in the province of Misiones in the Fields and Weedlands ecoregion (Barquez 2006; Barquez and Díaz 2009; Barquez et al. 1999; Idoeta et al. 2012).

Here we add the first record of *C. planirostris* from the province of Corrientes and from the Humid Chaco ecoregion, where this species was previously unknown. In addition, we include some comments on the natural history of *C. planirostris*, including roost use, and on the structure of the bat assemblage observed in the study area.

Methods

During bat sampling conducted on 28 November 2019, five males of *Cynomops planirostris* were captured, four of which were released and one was collected and deposited in the Colección de Mastozoología de la Facultad de Ciencias Exactas y Naturales y Agrimensura (CM-FaCENA), Universidad Nacional del Nordeste, Corrientes, Argentina.

The sampling site is the Campus Universitario Deodoro Roca, Universidad Nacional del Nordeste, near Ruta Nacional 12 (27°27′50.40″S, 058°46′55.20″W; 50 m elev.) and is within a periurban area for public use (Fig. 1). It is located in the Humid Chaco ecoregion, which characterizes a small portion of the northwest corner of the province of Corrientes (Burkart et al. 1999), where the natural vegetation is a mosaic of grasslands, palm savannas, and forests, with native and introduced woody trees, including such species as *Prosopis alba* Griseb., *Delonix regia* (Bojer ex Hook.) Raf., *Melia azedarach* L., *Ceiba speciosa* (A. St.-Hil.) Ravenna, and *Enterolobium contortisiliquum* (Vell.) Morong. At the edges, are palm trees, like *Syagrus romanzoffiana* (Cham.) Glassman, and grasses, like *Andropogon lateralis* Nees, *Paspalum notatum* Flüggé and *P. atratum* Swallen.

The specimens were captured with a 6 × 3 m mist net, with 12 × 12 mm mesh, placed 1.5 m above the ground at the exit of a previously identified shelter.

The mist net remained open for 4 hours between 18:00 and 22:00 h and was checked every 20 minutes. The captured specimens were identified following Barquez et al. (2020), and the collected specimen was processed and taxidermized as indicated in Barquez et al. (2021). Measurements indicated in Table 1 follow the definitions of Barquez et al. (1999) and Barquez et al. (2020) and were taken with digital calipers to the nearest 0.05 mm. Body weight was taken with a 100 g Pesola® spring scale. Descriptions of body and cranial measurements in Table 1 are as follows: total length, distance from the tip of the snout to the tip of the tail; tail length, distance between the point of insertion of the tail into the body and the last caudal vertebra; hindfoot length, distance from the heel to the tip of the longest digit including the claw; ear length, distance between the notch and the tip of the pinna; weight, body weight in grams; forearm length, distance between the elbow and the wrist when the wing is folded; greatest length of skull, distance from the anterior most point of the rostrum (excluding the incisors) to the posterior most point of the cranium; condylobasal length, distance from the anterior most edge of the premaxilla to the posterior most projection

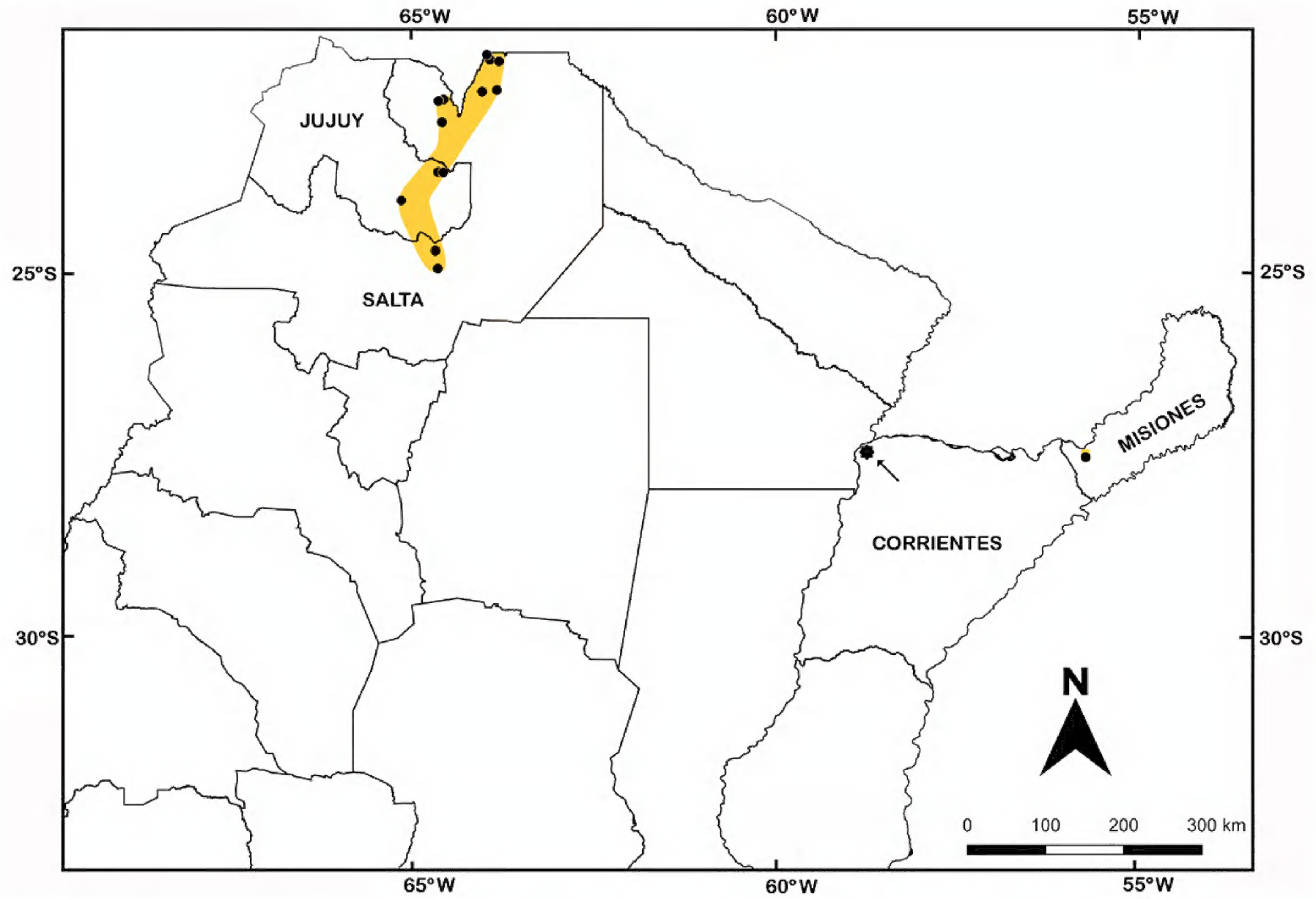

Figure 1. Map of the north of Argentina indicating the known localities for *Cynomops planirostris*. The colored spot in the northwest indicates the estimated distribution of the species in the region, based on the known distribution points cited by Idoeta et al. (2012). The rosette and the arrow indicate the new locality in the province of Corrientes (Map modified from Barquez et al. 2020).

of the occipital condyles; least interorbital breadth, least distance between the orbits; postorbital constriction, least distance across the cranium measured posterior to the postorbital processes; breadth of braincase, width of the cranium measured just posterior to the zygomatic arches; zygomatic breadth, greatest distance across the outer margins of the zygomatic arches; mastoid breadth, width of the cranium including the mastoid processes; palatal length, distance from the posterior margin of the alveolus of the incisors to the caudal spine or median posterior border of the palate; length of mandible, distance from the anterior most point (excluding the incisors) to the posterior most point of the mandible; length of maxillary toothrow, distance from the anterior margin of the alveolus of the canine to the posterior margin of the alveolus of the last molar; length of mandibular toothrow, distance from the anterior margin of the alveolus of the canine to the posterior margin of the alveolus of the last molar; and width across canines, distance between the outer margins of the upper canines.

Results

Molossidae

***Cynomops planirostris* (Peters, 1866)**
Figures 1–3, Table 1

Materials examined. ARGENTINA • 1 adult; Corrientes Province, Capital Department, Campus Universitario

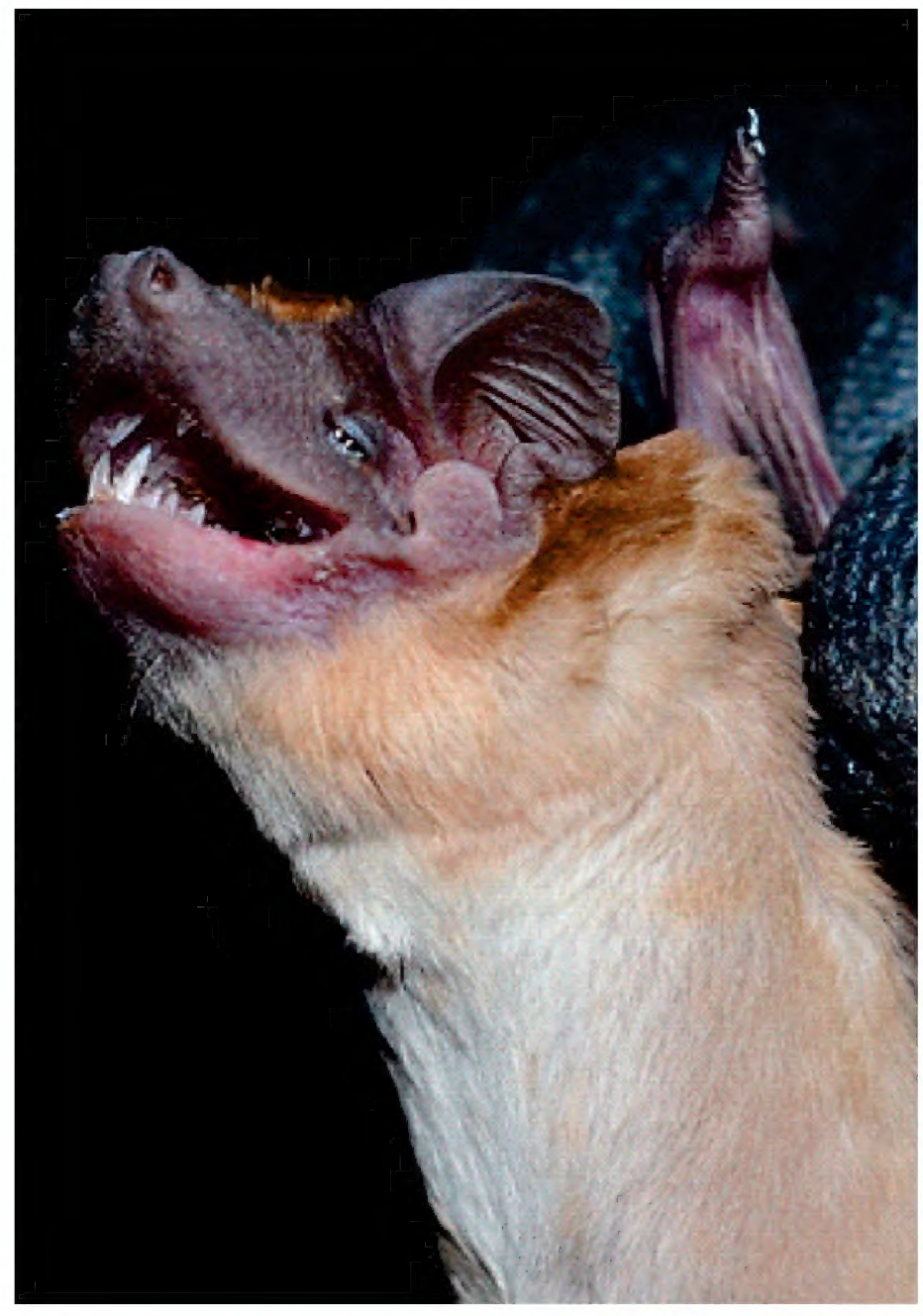

Figure 2. Specimen of *Cynomops planirostris* captured in the Campus Universitario Deodoro Roca, Corrientes Capital, Argentina (Photo: Antonella Argoitia).

Figure 3. Lateral, dorsal, and ventral views of the skull of *Cynomops planirostris* (CM-FaCENA256). Scale bar = 5mm (Photos: Antonella Argoitia).

Deodoro Roca, Universidad Nacional del Nordeste, near to Ruta Nacional 12; 27°27′50.40″S, 058°46′55.20″W; 50 m elev.; 28.XI.2019; Antonella Argoitia and Pedro Cuaranta leg.; skeleton and skin; 1 ♂, CM-FaCENA 256.

Identification. The collected specimen (Fig. 2) agrees well with the description given by Barquez et al. (1999). The dorsal coloration is brown, with hairs paler, generally cream, at their bases. Ventrally, a prominent pale patch, mostly white, is evident on the throat, neck, chest, and part of the abdomen. In all specimens seen, this patch was variable in width, but distinctive from the surrounding pelage. The wing membranes are dark brown. The ears are wide and rounded, the tragus is small, higher than wide, with a rounded tip and a small bump at its midpoint. The antitragus is well developed, semicircular, and extends forward as a fold of skin that reaches the corner of the mouth. The ear keel is well marked and extends midway across the internal part of the ear. The muzzle is notably procumbent, flat, and wide. The upper lip has a fringe of fine hairs and the lower lip is naked. The calcars are long and extend for half the distance between the feet and tail, as in the other species from Argentina.

The skull (Fig. 3) is similar to other *Cynomops* from

Table 1. Body and cranial measurements of the specimen of *Cynomops planirostris* from Corrientes (CM-FaCENA256), compared with specimens from Misiones and Northwestern Argentina as reported by Idoeta et al. (2012). See description of measurements in Methods.

Measurement	Corrientes	Misiones			Northwestern Argentina		
	CM-FaCENA 256	*X*	Range	*n*	*X*	Range	*n*
Total length (mm)	88.1	91.6	89.00–94.00	5	86.12	83.00–90.00	8
Tail length (mm)	24.9	25.8	21.00–31.00	5	27.50	24.00–30.00	8
Hindfoot length (mm)	6.5	6.4	6.00–7.00	5	6.62	6.00–8.00	8
Ear Length (mm)	13.3	13.6	13.00–14.00	5	13.75	11.00–16.10	8
Weight (g)	13.8	13.3	12.00–15.00	5	11.50	10.50–12.00	5
Forearm length (mm)	35.6	33.99	32.68–35.00	5	32.46	31.19–33.85	8
Greatest length of skull (mm)	16.7	15.89	13.30–17.80	5	15.82	15.02–16.92	7
Condylobasal length (mm)	16.6	15.31	14.80–16.50	5	15.67	14.78–16.74	7
Least interorbital breadth (mm)	6.8	6.60	6.20–7.18	5	6.60	6.18–7.10	8
Postorbital constriction (mm)	4.1	4.33	4.10–4.60	5	4.26	3.91–4.59	8
Breadth of braincase (mm)	8.2	8.05	7.80–8.30	5	7.94	7.68–8.18	8
Zygomatic breadth (mm)	11.6	10.98	10.56–11.58	5	10.91	10.76–11.35	5
Mastoid breadth (mm)	11.0	10.24	9.68–11.50	5	10.23	9.70–10.78	5
Palatal length (mm)	7.0	6.51	6.38–7.10	5	6.50	6.16–6.98	8
Length of mandible (mm)	13.3	12.54	12.14–13.58	5	12.31	11.69–13.44	7
Length of maxillary toothrow (mm)	7.6	6.44	6.20–7.00	5	6.26	5.89–6.73	8
Length of mandibular toothrow (mm)	7.8	6.80	6.58–7.50	5	6.68	6.30–7.32	8
Width across canines (mm)	4.9	4.60	4.38–5.00	5	4.48	4.07–4.76	8

Argentina, but smaller; in *Cynomops abrasus* (Temminck, 1826), the greatest length of skull is more than 19 mm, whereas in *C. planirostris* and *Cynomops* sp. (previously treated as *C. paranus* in Barquez et al. 2020) the length is less than 17.8. The mastoid process is present, but not as well developed as in *Cynomops* sp. The teeth are similar to that of *Cynomops* sp., but the upper premolar is almost rectangular (while in *Cynomops* sp. it is less rectangular). Dental formula: 1/2, 1/1, 1/2, 3/3 = 28.

Remarks. We collected the specimen of *C. planirostris* reported here in the hollow of a tree, *Enterolobium contortisiliquum*. The hole had a diameter of 6 cm, and its opening was 2.3 m above ground level, facing 49° northeast and partially covered by epiphytes, including air carnations, cacti, and ferns. The bats began to leave the shelter at sunset, around 18:40 h. A few minutes before departure, vocalizations were heard and movements were observed inside the shelter.

Another six species of bats were recorded in the area: *Eptesicus furinalis* (d'Orbigny & Gervais, 1847), *Eumops patagonicus* Thomas, 1924, *Eumops perotis* (Schinz, 1821), *Molossops temminckii* (Burmeister, 1854), *Molossus fluminensis* Lataste 1891, and *Molossus molossus* (Pallas, 1766). Two of these species (*E. patagonicus* and *M. molossus*) were found and forming a mixed colony, in a building used for materials storage. The entry and exit of individuals from that colony was made through an opening, which was located at a height of 2.1 m from the ground facing 343° north, in one of the corners of the roof of the building. The finding of this colony adds another type of anthropic refuge for these species, to those already reported by Di Benedetto et al. (2017).

In addition, a colony of at least six individuals of *M. fluminensis* was recorded in a natural shelter, located in the hollow of a branch of a tree (*Enterolobium contortisiliquum*); the hole was 22.65 cm in diameter, at a height of 2.25 m above the ground, and oriented 256° west (Fig. 4).

It is also important to mention that the first known record of the genus *Cynomops* for Corrientes was reported based on a specimen collected near to our study site, at a distance of approximately 3 km south of Corrientes Capital (Barquez et al. 1999). Originally cited as *C. paranus* (Barquez et al. 1999), this specimen probably represents an undescribed species, well distinguishable from *C. planirostris*.

Discussion

This paper documents the presence of *C. planirostris* in the province of Corrientes, Argentina, and adds the species to the Humid Chaco ecoregion. During the sampling, five specimens were captured, all males with abdominal testicles. This new information extends the known distribution of the species in northeastern Argentina by approximately 300 km west of the nearest known locality in the province of Misiones (Idoeta et al. 2012). Also, this record increases to 34 the number of bat species known for the province of Corrientes (Barquez et al. 2020; Collett and D'Occhio 2020).

The available information on the distribution of *C. planirostris* in Argentina is scarce, and this taxon is, indeed, poorly represented in scientific collections (Idoeta et al. 2012). At least partially, this may be due to their fast-flying aerial foraging behavior in open spaces and at high altitudes (Kalko et al. 1996), which makes their capture difficult. It has been reported that this species forms small colonies, with fewer than 15 individuals (Vizotto and Taddei 1976).

In Argentina, *C. planirostris* has been categorized as Least Concern by López Berrizbeitia et al. (2019)

because it is considered to be frequent throughout its distributional range and because it is present in protected areas. However, population studies are important, as the regions in which this species occurs are suffering a high degree of fragmentation and environmental degradation (Burkart et al. 1999).

Foraging habits of this species make it difficult to be captured with mist nets, which are normally placed at ground level or at a height of no more than 3 m. Therefore, the search for shelters and the application of other more specialized sampling methods will be of great help to increase the records (Idoeta et al. 2012). Specialized sampling should include acoustic records, which will probably allow for more occurrence data on this species in northern Argentina, especially in regions and at localities poorly sampled so far. In this way, increasing information about its natural history and ecology will help, in turn, to clarify different aspects of its systematics, biogeography and evolution, which are still under discussion.

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Authors' Contributions

AA and PC captured and photographed the specimen; AA and RMB reviewed and identified the species; AA and RMB wrote the text.

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